

AGREEMENT  
ON COOPERATIVE THERMAL-HYDRAULIC  
CODE APPLICATIONS AND MAINTENANCE RESEARCH  
AND  
SEVERE ACCIDENT RESEARCH  
BETWEEN  
THE UNITED STATES NUCLEAR REGULATORY COMMISSION  
AND  
THE BULGARIAN NUCLEAR REGULATORY AGENCY

The United States Nuclear Regulatory Commission (USNRC) and the Bulgarian Nuclear Regulatory Agency (BNRA) (hereinafter referred to as the "Parties");

Considering that the Parties:

1. Have a mutual interest in cooperation in the field of reactor and plant systems research with the objective of improving and helping to ensure the safety of reactors internationally;
2. Have a mutual objective of reciprocity in the exchange of technical information;
3. Have cooperated with the USNRC in the area of thermal hydraulic safety research in the Thermal-Hydraulic Code Applications and Maintenance Program (CAMP) since February 11, 1994. This Agreement extends the CAMP cooperative activities for an additional three years and expands the cooperative research activities to include Cooperative Severe Accident Research;

The Parties have agreed as follows.

## ARTICLE I - PROGRAM COOPERATION

The Parties, in accordance with the provisions of this Agreement and subject to applicable laws and regulations in force in their respective countries, will join together for cooperative nuclear reactor safety research in the areas of thermal hydraulic code applications and maintenance research (CAMP), and severe accident research programs (CSARP), hereinafter referred to as CAMP and CSARP.

## ARTICLE II - FORMS OF COOPERATION

Cooperation between the Parties may take the following forms:

- A. The exchange of information in the form of technical reports, experimental data, correspondence, newsletters, visits, joint meetings, and such other means as the Parties agree.
- B. The temporary assignment of personnel of one Party or of its contractors to laboratories or facilities owned by the other Party or in which it sponsors research. Each assignment will be considered on a case-by-case basis and will generally require a separate agreement.
- C. The execution of joint programs and projects, including those involving a division of activities between the Parties. Each joint program and project will be considered on a case-by-case basis and may be the subject of a separate agreement, if determined to be necessary by either of the Parties to this Agreement or their research organizations. Otherwise, it will be accomplished by an exchange of letters between the research organizations of the Parties, subject at least to the terms and conditions of the present Agreement.
- D. The use by one Party of facilities that are owned by the other Party or in which research is being sponsored by the other Party. Use of these facilities may be subject to commercial terms and conditions.
- E. If a Party wishes to visit, assign personnel, or use the facilities owned or operated by entities other than the Parties to this Agreement, the Parties recognize that the approval of such entities will in general be required by the Receiving Party.
- F. Any other form agreed between the Parties.

## ARTICLE III - SCOPE OF AGREEMENT

Program Objectives:

- A. Thermal-Hydraulic Code Applications and Maintenance Program (CAMP)
  - a. Share experience on code errors and inadequacies and cooperate in resolving the deficiencies and maintaining a single, internationally recognized code

version. Software quality assurance procedures will be followed and code configuration control will be maintained. Standard programming language will be applied and code portability will be maintained.

- b. Share user experience on code scalability, applicability, and uncertainty studies.
  - c. Share a well documented code assessment data base.
  - d. Share experience on full scale power plant safety-related analyses performed using the code. This includes analyses of operating reactors, advanced light water reactors, transients, risk-dominant sequences including the front-end of severe accident sequences, and accident management and operator procedures-related studies.
  - e. Maintain and improve user expertise and documented user guidelines for applying the code and share a well-documented code assessment database.
1. USNRC Scope of Responsibility
- a. Subject to the availability of appropriated funds, the USNRC will provide over the duration of this Agreement the following specified goods and services:
  - b. Coordination and Program Management. The Thermal-Hydraulic Code Applications and Maintenance Program (CAMP) will be coordinated by the USNRC. Program information will be documented and circulated via newsletters and NUREG/IA documents. A Technical Program Committee (TPC), comprised of representatives from the Parties, will meet regularly to report on code errors and modeling deficiencies, and recommend and assign rankings to code correction and improvement needs, including approaches to resolution. Error corrections and model improvements will be made, within the limits of available resources allocated for each code, taking into account a priority list recommended by the TPC. The TPC will also exchange information on applications and assessment results. The TPC meetings will be held twice per year, once in the U.S. and once abroad.
  - c. Reactor Systems Simulation Codes. RELAP5/MOD3 and TRACE (formerly TRAC-M), will be maintained. Code updates will be available in source form on machine-readable media. Complete available documentation will be maintained consisting of: code manuals, models and correlations document, developmental assessment document, user guidelines document, and independent assessment documents. Code configuration control will be maintained to provide an internationally recognized code version.
  - d. The USNRC will provide to the BNRA the TRACE code.

- e. The USNRC will provide to the BNRA the RELAP5/MOD3 code and associated documentation. The USNRC will also provide subsequent updates of the code and associated documentation that are released during the Agreement period.
- f. Symbolic Nuclear Analysis Package (SNAP). SNAP is a graphical user interface and provides a computational environment currently with pre-processor capabilities that assist the user in the development of RELAP5 and TRACE input decks and in running the code. SNAP will be provided. Subsequent updates of SNAP and associated documentation that are released during the Agreement period will also be provided.

2. BNRA Scope of Responsibility

In-Kind Contribution. The BNRA shall submit to the USNRC one code assessment report per year or other work products of equivalent value. The assessment reports shall contain assessment information on the NRC codes that are released through this Agreement. The content of assessment reports is defined in NUREG-1271. The USNRC will have the nonexclusive right to publish these assessment reports containing nonproprietary information as NUREG/IA reports with proper reference to the originating Party.

3. Code Applications Analyses to be Exchanged by the Parties

- a. Code Scaling Applicability and Uncertainty Evaluations. An example of such studies was documented in NUREG/CR-5249.
- b. Issue Resolution. Safety issues may arise requiring that analyses be performed to determine whether a particular problem exists. Examples include pressurized thermal shock, interfacing systems LOCA, and long-term cooling following a LOCA. Those safety issue analyses performed using the codes specified in Section A.1. of Article III which are not proprietary will be exchanged.

B. Cooperative Severe Accident Research Program (CSARP)

As part of this Agreement, the BNRA will also participate in the international Cooperative Severe Accident Research Program (CSARP) sponsored by the USNRC. The objective is to provide for collaboration between the Parties on the nuclear safety severe accident research programs. It is recognized that the USNRC's and the BNRA's programs may be subject to change as the work progresses.

1. Obligations of the USNRC

The present USNRC CSARP program includes the following elements: MELCOR code development, assessment, and maintenance, MELCOR Cooperative Assessment Program (MCAP), MELCOR code workshop, and Cooperative Severe Accident Research Program (CSARP) annual review meetings. Emphasis of USNRC research will be placed upon consolidation of

MELCOR and integrating elements of the SCADAP/RELAP and CONTAIN code, as well as on the resolution of remaining phenomenological uncertainties arising both from generic and specific aspects of severe accident applications and related plant-specific analyses.

Subject to the availability of appropriated funds, the USNRC will perform the following:

- a. Provide the BNRA with copies of all permanent technical program documents such as quick look reports, technical memoranda, and laboratory reports as soon as they have received appropriate management review.
- b. Transmit to the BNRA relevant severe accident codes and accommodate reasonable requests from the BNRA for support in their implementation and use.
- c. Permit Bulgarian personnel sponsored by the BNRA to participate in technical program review meetings and technical progress meetings except for those meetings concerned with administrative and fiscal matters.

2. Obligations of the BNRA

The BNRA will participate in the USNRC CSARP program by periodically providing in-kind technical contributions which will be drawn from BNRA's severe accident research. The BNRA will employ its best efforts to perform severe accident research work complementary to the USNRC program, subject to the constraint that the objective of its research program is to address Bulgarian nuclear safety concerns and issues.

Subject to the availability of appropriated funds, the BNRA will provide the USNRC with:

- a. Summary Results of the BNRA research program in severe accident research.
- b. Copies of reports, technical memoranda, and notes which are derived from its analyses using codes and data obtained from the USNRC's programs, and which are at the disposal of the BNRA.
- c. All updates, modifications, and corrections made by the BNRA to codes that have been supplied by the USNRC and documentation sufficient to enable an evaluation to be made by the USNRC.

ARTICLE IV - ADMINISTRATION OF THE AGREEMENT

- A. The Parties will each designate one representative to coordinate and determine the detailed implementation of this Agreement. These representatives may, at their

discretion, delegate this responsibility to the appropriate individual with respect to a given issue. The single designated representative will be referred to as the Administrator of this Agreement.

- B. The Agreement restricts dissemination of proprietary and other confidential or privileged information.
- C. The Parties will endeavor to select technical personnel for assignment in the program who can contribute positively to the program. Technical personnel assigned to the program will be considered visiting scientists (nonsalaried) within the program and will be expected to participate in the conduct of the analyses and experiments of the program as mutually agreed.
- D. Each Party to this Agreement will have access to all non-proprietary reports written by the other Party's technical personnel assigned to the respective programs that derive from its participation in the Agreement.
- E. Administrative details concerning questions such as security, indemnity, and liability related to the assignees or trainees will be addressed in personnel assignment agreements between the respective Parties.
- F. Travel costs, living expenses and salaries of visiting technical personnel or personnel participating in program review meetings shall be borne by their respective organizations.

#### ARTICLE V - EXCHANGE AND USE OF INFORMATION AND INTELLECTUAL PROPERTY

##### A. General

The Parties support the widest possible dissemination of information provided or exchanged under this Agreement, subject both to the need to protect proprietary or other confidential or privileged information as may be exchanged hereunder, and to the provisions of the Intellectual Property Addendum, which is an integral part of this Agreement.

##### B. Definitions

For purposes of this Agreement:

1. The term "information" means nuclear energy-related regulatory, safety, safeguards, waste management, scientific, or technical data, including information on results or methods of assessment, research, and any other knowledge intended to be provided or exchanged under this Agreement.
2. The term "proprietary information" means information developed outside or made available under this Agreement which contains trade secrets or other privileged or confidential commercial information (such that the person having the information may derive an economic benefit from it or may have a competitive

advantage over those who do not have it), and may only include information which:

- a. has been held in confidence by its owner;
  - b. is of a type which is customarily held in confidence by its owner;
  - c. has not been transmitted by the owner to other entities (including the Receiving Party) except on the basis that it be held in confidence;
  - d. is not otherwise available to the Receiving Party from another source without restriction on its further dissemination; and
  - e. is not already in the possession of the Receiving Party.
3. The term "other confidential or privileged information" means information, other than "proprietary information", which is protected from public disclosure under the laws and regulations of the country of the Party providing the information and which has been transmitted and received in confidence.

C. Marking Procedures for Documentary Proprietary Information

A Party receiving documentary proprietary information pursuant to this Agreement will respect the privileged nature thereof, provided such proprietary information is clearly marked with the following (or substantially similar) restrictive legend:

This document contains proprietary information furnished in confidence under an Agreement dated \_\_\_\_\_ between the United States Nuclear Regulatory Commission and the Bulgarian Nuclear Regulatory Agency and will not be disseminated outside these organizations, their consultants, contractors, and licensees, and concerned departments and agencies of the Government of the United States, and the Government of Bulgaria without the prior approval of (name of Transmitting Party). This notice will be marked on any reproduction hereof, in whole or in part. These limitations will automatically terminate when this information is disclosed by the owner without restriction.

This restrictive legend will be respected by the Receiving Party and proprietary information bearing this legend will not be used for commercial purposes, made public, or disseminated in any manner unspecified by or contrary to the terms of this Agreement without the consent of the Transmitting Party.

D. Dissemination of Documentary Proprietary Information

1. In general, proprietary information received under this Agreement may be freely disseminated by the Receiving Party without prior consent to persons within or employed by the Receiving Party, and to concerned Government departments and Government agencies in the country of the Receiving Party.
2. In addition, proprietary information may be disseminated without prior consent to:
  - a. Prime or subcontractors or consultants of the Receiving Party located within the geographical limits of that Party's nation, for use only within the scope of work of their contracts with the Receiving Party in work relating to the subject matter of the proprietary information;
  - b. Domestic organizations permitted or licensed by the Receiving Party to construct or operate nuclear production or utilization facilities, or to use nuclear materials and radiation sources, provided that such proprietary information is used only within the terms of the permit or license; and
  - c. Domestic contractors of organizations identified in Section D.2.b. of Article V, for use only in work within the scope of the permit or license granted to such organizations;

Provided that any dissemination of proprietary information under Section D.2.a., D.2.b., and D.2.c. of Article V shall be on an as-needed, case-by-case basis, shall be pursuant to an agreement of confidentiality, and shall be marked with a restrictive legend substantially similar to that appearing in Section C of Article V.

3. With the prior written consent of the Party furnishing proprietary information under this Agreement, the Receiving Party may disseminate such proprietary information more widely than otherwise permitted in Sections D.1 and D.2. of Article V. The Parties shall cooperate in developing procedures for requesting and obtaining approval for such wider dissemination, and each Party will grant such approval to the extent permitted by its national policies, regulations and laws.

E. Marking Procedures for Other Confidential or Privileged Information of a Documentary Nature

A Party receiving under this Agreement other confidential or privileged information shall respect its confidential nature, provided that such information is clearly marked so as to indicate its confidential or privileged nature and is accompanied by a statement indicating that the information is:



1. Protected from public disclosure by the Government of the Transmitting Party;  
and
2. Transmitted under the condition that it be maintained in confidence.

F. Dissemination of Other Confidential or Privileged Information of a Documentary Nature

Other confidential or privileged information may be disseminated in the same manner as that set forth in Section D. of Article V, Dissemination of Documentary Proprietary Information.

G. Non-Documentary Proprietary or Other Confidential or Privileged Information

Non-documentary proprietary or other confidential or privileged information provided in seminars and other meetings arranged under this Agreement, or information arising from attachments of staff, use of facilities, or joint projects, shall be treated by the Parties according to the principles specified for documentary information in this Agreement, provided, however, that the Party communicating such proprietary or other confidential or privileged information has placed the recipient on notice as to the character of the information communicated.

H. Consultation

If, for any reason, one of the Parties becomes aware that it will be, or may reasonably be expected to become, unable to meet the non-dissemination provisions of this Agreement, it shall immediately inform the other Party. The Parties shall thereafter consult to define an appropriate course of action.

I. Other

1. Nothing contained in this Agreement shall preclude a Party from using or disseminating information received without restriction by a Party from sources outside of this Agreement.
2. All USNRC computer codes disseminated under this Agreement are to be considered privileged information unless otherwise noted, are protected as such by the USNRC, and shall be treated likewise by the BNRA. They are, in particular, subject to all of the provisions of this Article, with the exception that they need not be marked with the restrictive designation. The codes are subject to this protection in both object and source forms and as recorded in any media.
3. The USNRC codes and other related analytical techniques covered under this Agreement, and any improvements, modifications or updates to such codes or techniques are for the purpose of reactor and plant systems research and licensing and shall not be used for commercial purposes, or for other benefits not related to the study of reactor safety without the prior consent of the USNRC.

Among the code uses that will be permitted under the CAMP agreements are those related to research in the reactor safety area and analyses performed by CAMP members or their contractors that can assist regulators and plant personnel in assessing the safety of the plant, analyzing operating events, and training of operators. Specific examples of permitted analyses include: design basis accidents (e.g., loss-of-coolant-accidents), anticipated transients, accident management and emergency operating procedures, mid-loop operation, analyses to support PRA success criteria, power upgrades and reload.

Prohibited uses of the code include: (1) analyses to develop a new reactor design; (2) analyses to support power upgrades and reload in the U.S. unless performed by a U.S. subsidiary.

4. The USNRC codes and other related analytical techniques shall not be advertised directly or by implication to obtain contracts related to the construction or servicing of nuclear facilities, nor shall advertising imply that the USNRC has endorsed any particular analyses or techniques.
5. All reports published within the scope of this Agreement and all meetings held shall be in English.

#### ARTICLE VI - DISPUTES AND WARRANTY OF INFORMATION

- A. All costs arising from implementation of this Agreement shall be borne by the Party that incurs them except when specifically agreed to otherwise. It is understood that the ability of the Parties to carry out their obligations is subject to the availability of funds. It is also understood that the terms herein agreed to represent feasible commitments according to the best understanding regarding resources and costs of the Parties at the time of signature.
- B. Cooperation under this Agreement shall be in accordance with the laws and regulations of the Parties' respective countries. Any dispute between the Parties concerning the Parties' interpretation or application of the Agreement shall be settled by mutual agreement.
- C. Information furnished by one Party to the other under this Agreement shall be accurate to the best knowledge and belief of the Party supplying the information. However, the application or use of any information exchanged or transferred between the Parties under this Agreement shall be the responsibility of the Party receiving the information, and the Transmitting Party does not warrant the suitability of the information for any particular use or application.
- D. The USNRC makes no warranties whatsoever for the ability or suitability of any USNRC code or other analytical technique to perform in any particular manner for any particular purpose, or to accomplish any particular task. The USNRC accepts no liability for damages of any type that may result from the use of its codes or other analytical techniques provided under this Agreement.

## ARTICLE VII - FINANCIAL CONSIDERATIONS

Cash contribution for participating in the CAMP and CSARP programs: At the time this Agreement is signed and on the anniversary of that date, the BNRA will transmit twenty thousand U.S. dollars (\$20,000) per year to the USNRC for the duration of this Agreement to participate in both Programs (i.e., CAMP and CSARP). Membership in the CAMP and CSARP programs will entitle the BNRA to receive the codes identified in Article III with their associated documentation. The BNRA will also receive subsequent updates of the codes and documentation that are issued during the Agreement period.

## ARTICLE VII - FINAL PROVISIONS

- A. This Agreement will enter into force upon signature of both Parties and shall remain in effect for three years. This Agreement may be extended for an additional period of time, upon mutual agreement of the Parties.
- B. The Parties enter into this Agreement with the understanding that reasonable allowances for normal delays will be made in completing the work. The Parties have the right to utilize information provided under this Agreement after its termination; however, all information protected by provisions of this Agreement as proprietary, confidential, privileged, or otherwise subject to restriction on disclosure shall remain so protected indefinitely unless otherwise mutually agreed in writing.
- C. A Party may terminate this Agreement after providing the other Party written notice of its intent to terminate at least 180 days in advance. The Party not terminating will notify the terminating Party before the effective date of termination if termination will result in the terminating Party receiving a disproportionate share of the expected benefit from this Agreement. Both Parties will endeavor to reach an equitable settlement of the matter through negotiation.
- D. The Parties to this Agreement reserve the right to modify or extend the specific activities described in Article III within the intended scope of the Agreement upon written concurrence of their Administrators.

- E. If the portion of the research program of any Party that is pertinent to this Agreement is substantially reduced or eliminated, the technical scope described in Article III may be adjusted to substitute research of equivalent programmatic interest upon mutual agreement of the Parties.

FOR THE UNITED STATES NUCLEAR  
REGULATORY COMMISSION:

BY: 

NAME: Luis A. Reyes  
(PRINT)

TITLE: Executive Director  
for Operations

DATE: 8/6/04

PLACE: Rockville, Maryland, USA

FOR THE BULGARIAN NUCLEAR  
REGULATORY AGENCY:

BY: 

NAME: Prof. Dr. Sc. Emil Vapirev  
(PRINT)

TITLE: Chairman

DATE: 17 Aug 2004

PLACE: Sofia, Bulgaria

## INTELLECTUAL PROPERTY ADDENDUM

Pursuant to Article V of this Agreement:

The Parties shall ensure adequate and effective protection of intellectual property created or furnished under this Agreement and relevant implementing arrangements. The Parties agree to notify one another in a timely fashion of any inventions or copyrighted works arising under this Agreement and to seek protection for such intellectual property in a timely fashion. Rights to such intellectual property shall be allocated as provided in this Addendum.

### I. SCOPE

- A. This Addendum is applicable to all cooperative activities undertaken pursuant to this Agreement, except as otherwise specifically agreed by the Parties or their designees.
- B. For purposes of this Agreement, "intellectual property" shall have the meaning found in Article 2 of the Convention Establishing the World Intellectual Property Organization, done at Stockholm, July 14, 1967; viz., "'intellectual property' shall include the rights relating to:
  - literary, artistic and scientific works,
  - performances of artists, phonograms, and broadcasts,
  - inventions in all fields of human endeavor,
  - scientific discoveries,
  - industrial designs,
  - trademarks, service marks, and commercial names and designations,
  - protection against unfair competition, and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields."
- C. This Addendum addresses the allocation of rights, interests, and royalties between the Parties. Each Party shall ensure that the other Party can obtain rights to intellectual property allocated in accordance with the Addendum by obtaining those rights from its own participants through contracts or other legal means, if necessary. This Addendum does not otherwise alter or prejudice the allocation between a Party and its nationals, which shall be determined by that Party's laws and practices.
- D. Disputes concerning intellectual property arising under this Agreement should be resolved through discussions between the concerned participating institutions or, if necessary, the Parties or their designees. Upon mutual agreement of the Parties, a dispute shall be submitted to an arbitral tribunal for binding arbitration in accordance with the applicable rules of international law. Unless the Parties or their designees agree otherwise in writing, the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL) shall govern.

- E. Termination or expiration of this Agreement shall not affect rights or obligations under this Addendum.

## II. ALLOCATION OF RIGHTS

- A. Each Party shall be entitled to a non-exclusive, irrevocable, royalty-free license in all countries to translate, reproduce, and publicly distribute scientific and technical journal articles, reports, and books directly arising from cooperation under this Agreement. All publicly distributed copies of copyrighted work prepared under this provision shall indicate the names of the authors of the work unless an author explicitly declines to be named.
- B. Rights to all forms of intellectual property, other than those rights described in Section II.A. of this Addendum, shall be allocated as follows:
1. Visiting researchers, for example, scientists visiting primarily in furtherance of their education, shall receive intellectual property rights under the policies of the host institution. In addition, each visiting researcher named as an inventor shall be entitled to share in a portion of any royalties earned by the host institution from the licensing of such intellectual property.
  2. (a) For intellectual property created during joint research, for example, when the Parties, participating institutions, or participating personnel have agreed in advance on the scope of work, each Party shall be entitled to obtain all rights and interests in its own country. The Party in whose country the invention was made shall have first option to acquire all rights and interests in third countries. If research is not designated as "joint research", rights to intellectual property arising from the research will be allocated in accordance with Section II.B.1. of this Addendum. In addition, each person named as an inventor shall be entitled to share in a portion of any royalties earned by either institution from the licensing of the property.  
  
(b) Notwithstanding Section II.B.2.(a) of this Addendum, if a type of intellectual property is available under the laws of one Party but not the other Party, the Party whose laws provide for this type of protection shall be entitled to all rights and interests worldwide. Persons named as inventors of the property shall nonetheless be entitled to royalties as provided in Section II.B.2.(a) of this Addendum.